

CM

WHAT IS CLAIMED IS:

## 1. A screen cylinder comprising:

a generally cylindrical screening medium having a plurality of openings therethrough;

a generally cylindrical structural backing plate having a plurality of openings therethrough; and

said screening medium and said structural backing plate lying concentrically one within the other and having respective opposed surfaces in engagement with one another at an interface therebetween whereby said backing plate structurally supports said screening medium;

one of said screening medium and said backing plate having a plurality of circumferentially extending recesses formed in its opposing surface and opening at the opposing surface of the other of said screening medium and said backing plate at the interface thereof establishing communication between the respective openings of said screening medium and said backing plate.

2. A screen cylinder according to Claim 1 wherein the openings in said screening medium extend in a generally axial direction substantially normal to the circumferential extent of said recesses.

claim

35

*Sub A2*

3. A screen cylinder according to Claim 2 wherein said slots have an extent sufficient to span in the axial direction two or more recesses.

*2*  
4. A screen cylinder according to Claim 1 including means for releasably connecting said screening medium and said backing plate one to the other.

5. A screen cylinder according to Claim 4 wherein said connecting means includes a shrink-fit one of said screening medium and said backing plate within the other of said screening medium and said backing plate.

*3*  
6. A screen cylinder according to Claim 4 wherein said connecting means includes welding said screening medium and said backing plate to one another.

*4*  
7. A screen cylinder according to Claim 4 wherein said connecting means includes gluing said screen medium and said backing plate one to the other.

*5*  
8. A screen cylinder according to Claim 4 wherein said connecting means includes soldering said screen medium and said backing plate one to the other.

<sup>6</sup>  
9. A screen cylinder according to claim 1 wherein said recesses are formed in the surface of said screening medium.

<sup>7</sup>  
10. A screen cylinder according to claim <sup>6</sup>9 including rivets for releasably connecting said screening medium and said backing plate one to the other.

<sup>9</sup>  
11. A screen cylinder according to Claim 1 wherein said recesses are formed in the surface of said backing plate.

12. A screen plate for screening pulp flowing therethrough comprising: ✓

a screening medium having a plurality of elongated contoured slots therethrough and extending generally parallel to one another;

a structural backing plate having a plurality of openings therethrough;

said screening medium and said structural backing plate lying in registration one with the other and having respective opposed surfaces in engagement with one another at an interface therebetween whereby said backing plate structurally supports said screening medium;

claims  
8-9

39

N  
 one of said screening medium and said backing plate having a plurality of recesses formed in its opposing surface and opening at the opposing surface of the other of said screening medium and said backing plate at the interface thereof establishing communication between the respective openings of said screening medium and said backing plate;

P  
 whereby pulp may flow sequentially through said contoured slots, said recesses and said openings in said backing plate.

N  
 13. A screen plate according to Claim <sup>12</sup>/~~12~~ wherein said screening medium and said backing plate are cylindrical and lie one within the other, the slots in said screening medium extending in a generally axial direction, said recesses extending in said one opposing surface in a direction substantially normal to the circumferential extent of said recesses.

K  
<sup>12</sup>/~~14~~. A screen cylinder according to Claim <sup>11</sup>/~~13~~ wherein said slots have an extent sufficient to span, continuously and without interruption, in the axial direction two or more recesses.

15. A screen cylinder according to Claim <sup>10</sup>/~~12~~ including means for releasably connecting said cylindrical screening and said backing cylinder one to the other.

NP  
NK

16. A screen cylinder according to Claim 15 wherein said connecting means includes a shrink-fit of one of said screening cylinder and said backing cylinder within the other of said screening cylinder and said backing cylinder.

<sup>16</sup>  
~~17~~. A screen plate according to ~~Claim 12~~ <sup>10 10</sup> wherein said recesses are formed in the opposing surface of said screening medium.

<sup>17</sup>  
~~18~~. A screen plate according to ~~Claim 12~~ <sup>10 10</sup> wherein said recesses are formed in the surface of said backing plate.

~~Substantially~~  
N  
P  
N

19. A screen cylinder according to Claim 13 wherein said cylindrical screening medium has elongated outflow slots formed in the opposing surface of screening medium in radial registry with said contoured slots and substantially coextensive therewith, reduced slots in registry with said contoured slots and said outflow slots and communicating therebetween, said recesses being formed on the inflow side of said backing plate whereby pulp may flow sequentially through said contoured slots, said reduced slots and said outflow slots of said screening medium and then through said recesses and said openings of said backing plate.

a  
a K

20. A method of manufacturing a ~~screening plate~~ <sup>screening</sup> for use in a ~~screen plate~~ <sup>screening</sup> for pulp, said screen plate

N  
P  
N  
K  
being formed of a screening plate and a backing plate, said screening plate having first and second opposite faces, comprising the steps of:

(a) forming openings through said first face and into the body of the screening plate to terminate within the screening plate body;

(b) forming grooves in the second face arranged to expose the openings formed in step (a) so that the openings extend entirely through the plate, and leave a plurality of ridges in the second face spaced one from the other therealong.

21. A method according to Claim 20, wherein prior to step (a) the first face is formed to include contoured grooves having at least two sides and a bottom, one of the sides being inclined relative to the other side thereof.

22. A method according to Claim 21, wherein step (a) is practiced such that said openings are formed in the bottom of said grooves.

a  
a  
18  
23. A method of manufacturing a ~~screening plate~~ <sup>screening</sup> for use in a ~~screen plate~~ for pulp, said ~~screen plate~~ being formed of a screening plate and a backing plate, said screening plate having first and second opposite faces, comprising the steps of:

pl (a) forming elongated, substantially parallel, grooves in said first face, each groove having a side face and a bottom;

pl (b) forming openings through the bottom of the grooves in said first face and into the screening plate to terminate within the screening plate short of said second face thereof;

pl (c) forming elongated grooves in the second face of said screening plate inclined relative to the longitudinal extent of the grooves formed in step (a) and to a depth to expose the openings formed in step (b) so that the openings extend entirely through said screening plate, and leave a plurality of ridges in the second face spaced one from the other therealong and extending in a direction inclined relative to the longitudinal extent of said ~~contoured~~ grooves.

a 19/19 24. A method according to Claim 18 wherein said screening plate is formed of metal.

20/25. A method according to Claim 19 including, subsequent to steps (a), (b) and (c), hardening or plating the metal of said screening plate.

21/26. A method according to Claim 18 wherein said screening plate is formed of a ceramic.

<sup>22</sup>  
~~21~~. A method according to ~~claim 23~~<sup>18</sup> including machining the first face of the screening layer to form ridges flat on one side and angled on the opposite side.

<sup>23</sup>  
~~28~~. A method according to ~~claim 23~~<sup>18</sup> including the step of forming the screening plate into a cylindrical shape to form a metal screen cylinder.

---

29. A method of manufacturing a screen cylinder including a discrete screening plate and a discrete backing plate comprising the steps of: ✓

(a) rolling a backing plate to form a backing cylinder;

(b) attaching the edges of said backing plate together to form a round cylinder;

(c) rolling a screening plate to form a screening cylinder;

(d) attaching the edges of the screening plate together to form a round cylinder;

(e) inserting one of said screening cylinder and said backing cylinder inside the other of said cylinders; and

END



(f) shrink-fitting said cylinders into engagement one with the other.

30. A method of fabricating screen cylinders for use in screening pulp and repairing a worn screen cylinder, comprising the steps of: ✓

forming a screening cylinder having elongated contoured grooves along an inflow side thereof and slots through said screening cylinder for communicating pulp between inflow and outflow sides of said screening cylinder;

forming a backing cylinder having a plurality of openings therethrough between inflow and outflow sides thereof;

inserting one cylinder within the other cylinder;

shrink-fitting said cylinders into engagement one with the other whereby said backing cylinder structurally supports said screening cylinder and enables flow of pulp through the contoured grooves and slots of said screening cylinder and the openings of said backing cylinder;

subsequent to use and when worn, removing the screening cylinder from said backing cylinder;

forming a second screening cylinder having elongated contoured grooves along an inflow side thereof and slots through said second screening cylinder for communicating pulp between inflow and outflow sides thereof;

engaging said second screening cylinder and said backing cylinder one to the other whereby said backing cylinder structurally supports said second screening cylinder and enables flow of pulp through said contoured grooves and slots of said second screening cylinder and the openings of said backing cylinder.

31. A method according to Claim 30 wherein said screening cylinders are formed incapable of providing sufficient structural strength for use in screen pulp under pressure in the absence of said backing cylinder.

*Added*